

REMARKS/ARGUMENTS

Reconsideration and allowance of the above-identified application is respectfully requested in view of the present Amendment. The Official Action, mailed October 14, 2003, has been carefully reviewed. By this Amendment, claims 1 and 9 have been amended.

The Examiner has rejected claims 1 and 4-6 under 35 U.S.C. 103(a) as being unpatentable over the Filippi, et. al. reference (U.S. Patent No. 5,883,301) in view of the Kammeraad, et. al. reference (U.S. Patent No. 5,507,176). It is respectfully submitted that a review of these references, taken individually or in combination, reveals that they do not make obvious the Applicants' invention. The Applicants' invention is directed to an apparatus and method for testing the integrity of vehicular fuel tanks. As such, the Applicants' invention includes a microprocessor that allows an external pressure source, such as a compressed nitrogen supply, to pressurize the fuel tank to a first pressure level. Once pressure stabilization has been achieved within the fuel tank, the external pressure source and a reference orifice contained within the tester are closed allowing the pressure within the tank to decay, if a leak is present within the tank. If no leaks are present within the fuel tank, the tank passes the test. If, however, a large leak is present in the fuel tank, the pressure within the tank decays rapidly and the fuel tank fails the test. If a relatively small leak exists, the fuel tank is repressurized by the external pressure source and a test is performed comparing the ratio of the time required for the pressure within the tank to decay from a first pressure level to a second pressure level through both the leak and the reference orifice contained within the tester and the time required for such a pressure decay to occur

through only the leak against a standard ratio. . By utilizing the ratio of the time required for the pressure within the tank to decay from a first pressure level to a second pressure level when only the leak within the tank is present and the time required for same to occur when both the leak within the tank is present and the reference orifice contained within the tester is open and then rationometrically comparing these times against a standard ratio, a determination can be made as to whether the leak is of such a size that it is acceptable.

The Filippi, et. al. reference (U.S. Patent No. 5,883,301) discloses a gasoline line leak detection system. As such, the apparatus disclosed in this reference is utilized to detect leaks in the piping between an underground fuel storage tank in a gas station and the fuel dispenser on a gas pump in the gas station. In contrast, the Applicants' invention is used for testing the evaporative fuel system on a vehicle. The calibrated leak shown in the Filippi, et. al. reference is used only as part of the installation process for the underground fuel storage tank and its associated fuel dispenser in order to calibrate the overall fuel dispensing system for subsequent leaks. Once calibration has been completed, the calibrated leak is removed from the fuel dispensing system. The calibrated leak is not included as part of the permanent testing apparatus used to make subsequent actual day to day leakage measurements of the fuel dispensing system. The reference orifice 23 referred to by the Examiner in the Filippi, et. al. reference is actually a leak, which exists in the pipeline that interconnects the fuel storage tank 20 with the fuel dispenser 12. In contrast, in the Applicants' invention, the fuel tank tester includes reference orifice that is contained within the tester and means to open and close this orifice thus allowing the user to effectively calibrate the tester during every

leakage test. Thus, the tests performed using the Applicants' tester are dynamic tests since the tester compensates for actual test conditions during every leakage test. In contrast, the tests performed by the Filippi, et al device are static tests since a leak which may exist in the piping is compared to a calibrated leak which was utilized at the time of installation of the underground fuel storage tank and its associated fuel dispenser and no compensation is provided in the apparatus disclosed in this reference for changes in actual test conditions. It should also be noted that this reference assumes that no leaks are present in the piping that interconnects the fuel storage tank and its associated fuel dispenser at the time of the installation of same and that, at the time of installation, the only leak that is present is through the calibrated leak. This may not be the case since leaks can be easily introduced into the aforementioned piping during the installation of the system.

As previously stated, the Applicants' invention determines the ratio of the time required for the pressure within the fuel tank to decay, between predetermined pressure levels, through any leaks which might exist in the fuel tank and the time required for the pressure within the fuel tank to decay, between predetermined pressure levels, through the combination of any leaks which might exist in the fuel tank and a reference orifice contained within the tester, and then ratiometrically compares these times against a predetermined standard ratio. In contrast, the Filippi, et. al. reference does not determine the time required for the pressure within the fuel tank to decay, between predetermined pressure levels, through the combination of any leaks, which might exist in the fuel tank and a reference orifice, since a reference orifice is not present during the testing procedure utilized by the Filippi, et. al. reference. A calibration or

reference orifice is utilized during the initial installation of the underground fuel storage tank and its associated fuel dispenser in the Filippi, et. al. reference, however, the calibration or reference orifice is removed after system installation and thus not utilized for any future tests. The Kammeraad, et. al. reference (U.S. Patent No. 5,507,176) discloses an evaporative emissions test apparatus and a method for utilizing same. As such, the evaporative emissions testing apparatus disclosed in this reference is connected to a vehicle fuel cap and its associated fuel filler neck. In contrast, the Applicants' invention is not connected to the vehicle fuel cap. In addition, the apparatus disclosed in the Kammeraad, et. al. reference does not utilize a reference orifice and means to open and close the reference for comparison of times associated with pressure decay rates. Furthermore, the Kammeraad, et. al. reference discloses an apparatus that utilizes an acceptable pressure drop over a fixed period of time. The Applicants' invention does not utilize a fixed period of time to measure pressure drops but rather measures the amount of time (which may vary) for the pressure within the fuel tank to decay between predetermined pressure levels. Lastly, the apparatus disclosed in the Kammeraad, et. al. reference does not compensate for the different volumes of various sizes of fuel tanks. In contrast, the Applicants' invention compensates for the different volumes of various sizes of fuel tanks since it measures the amount of time for the pressure within the fuel tank to decay between predetermined pressure levels and this time measurement is dependent upon fuel tank volume and the size of the leak within same.

In view of the foregoing differences between the Applicants' invention and the aforementioned references, it is respectfully submitted that these references, taken

individually or in combination, do not make obvious the Applicants' invention and that that the Applicants' invention is patentable thereover. However, in order to more specifically define the Applicants' invention, by this Amendment, independent claim 1 has been amended to specifically recite that the times that are measured are compared with predetermined ratiometric time relationships for such pressure drops to occur in order to determine whether the fuel tank has an acceptable leakage rate. By this Amendment, it is respectfully submitted that claim 1, and all claims dependent thereon, are now in condition for allowance.

The Examiner has rejected claims 9, 10 and 11 under 35 U.S.C. 103(a) as being unpatentable over the Filippi, et. al. reference (U.S. Patent No. 5,883,301) in view of the Dodge reference (U.S. Patent No. 4,575,807). The Dodge reference (U.S. Patent No. 4,575,807) is directed to a method and apparatus for determining a leakage rate in a vehicle transmission. In contrast, the Applicants' invention is used to determine leakage rates in the evaporative fuel system on a vehicle, and thus, the Dodge reference discloses non-analogous art since it is not in the field of the Applicants' endeavor or reasonably pertinent to the particular problem with which the Applicant is concerned. In addition, the apparatus disclosed in the Dodge reference does not utilize a reference orifice and means to open and close the orifice for comparison of pressure decay rates. In view of the previously referred to structural and operational differences between the aforementioned references and the Applicants' invention, and further in view of the fact that the Dodge reference discloses non-analogous art, it is respectfully submitted that the Applicants' invention is not obvious in view of these references, and that the Applicants' invention is patentable thereover. However, in order to more specifically

define the Applicants' invention, claim 9 has been amended to specifically recite that the times are compared with a predetermined time for a pressure drop to occur in order to determine whether the fuel tank has an acceptable leakage rate. By this Amendment of claim 9, it is respectfully submitted that this claim, and the claim that is dependent thereon, are now in condition for allowance. It should be noted that independent claim 11 makes reference in step k) thereof that the stored times are compared against a standard time ratio to determine whether the fuel tank has an acceptable leakage rate. None of the aforementioned references discloses the use of ratios, and thus, it is respectfully submitted that independent claim 11 is not obvious in view of the aforementioned references, and is patentable thereover.

In view of this Amendment, it is respectfully submitted that the above application is in condition for allowance, and such action is requested.

Respectfully submitted,



JAMES A. HUDAK, Reg. No. 27,340
Attorney for Applicants
29425 Chagrin Blvd., Suite #304
Cleveland, Ohio 44122-4602
(216) 292-3900

Date: April 12, 2004